

FIG. 1A

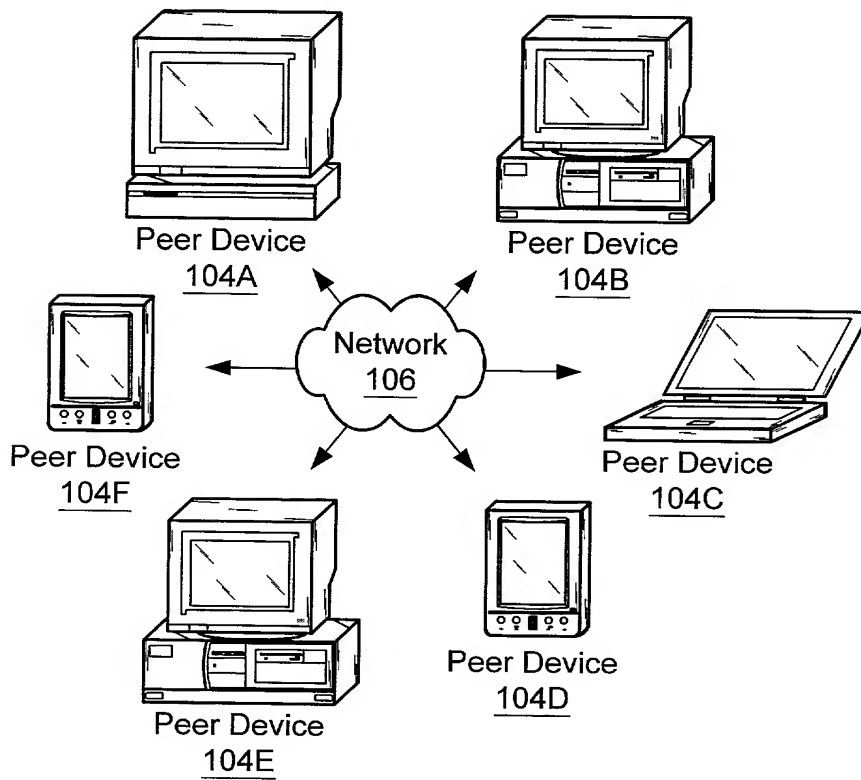


FIG. 1B

10055644.01200

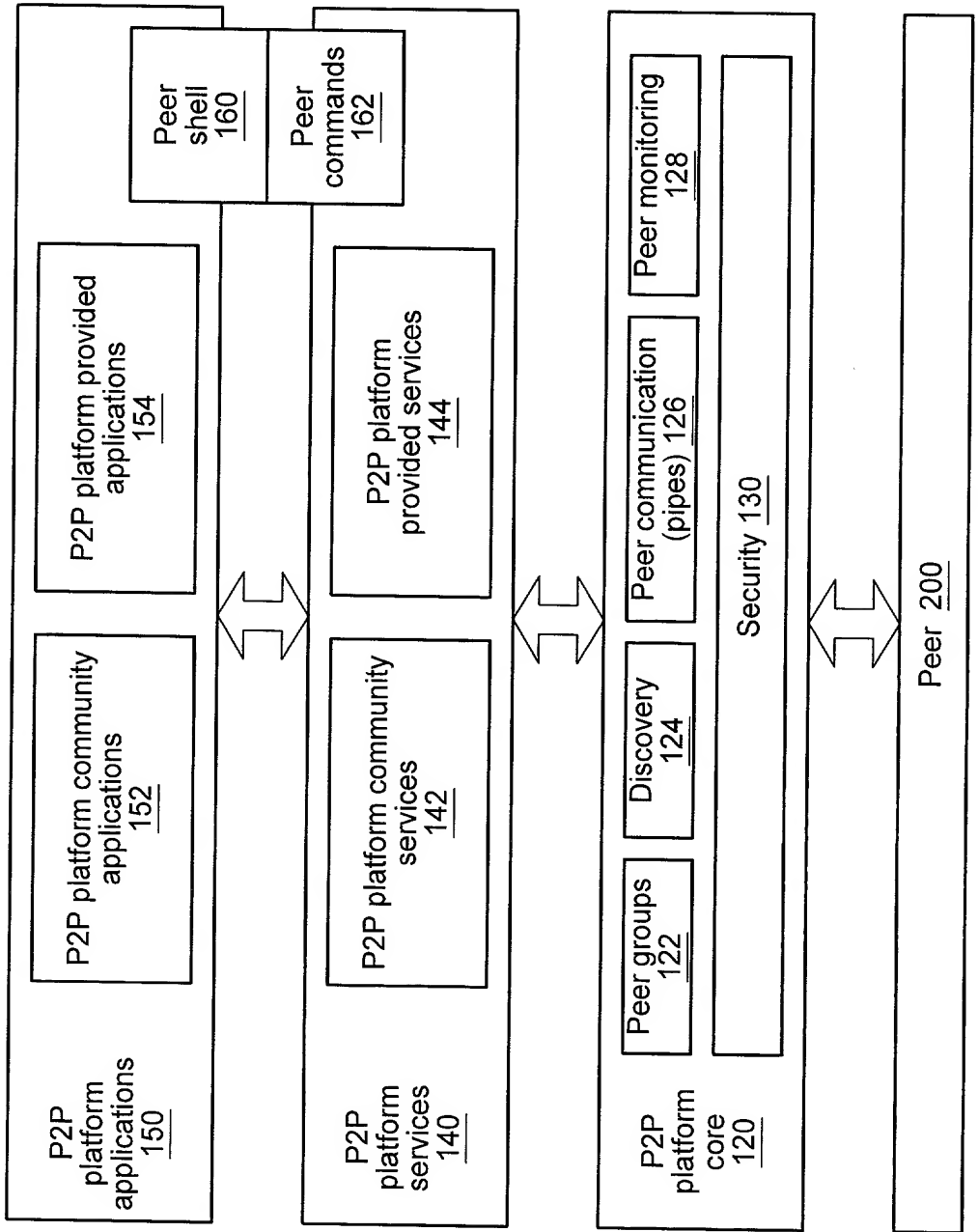


FIG. 2

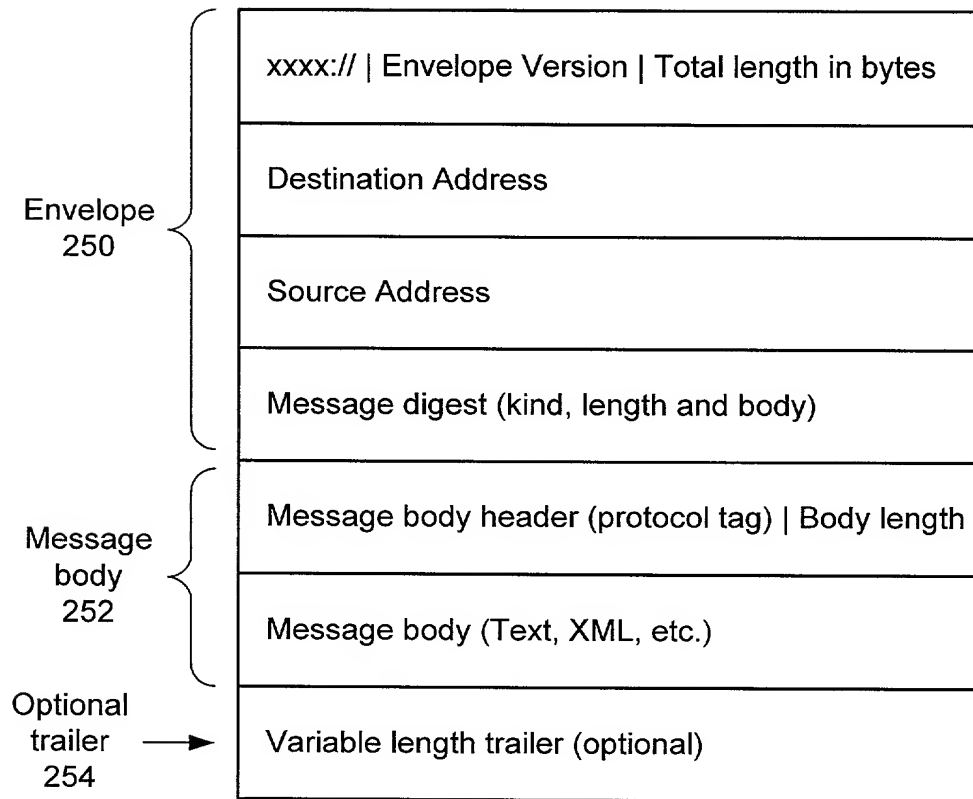
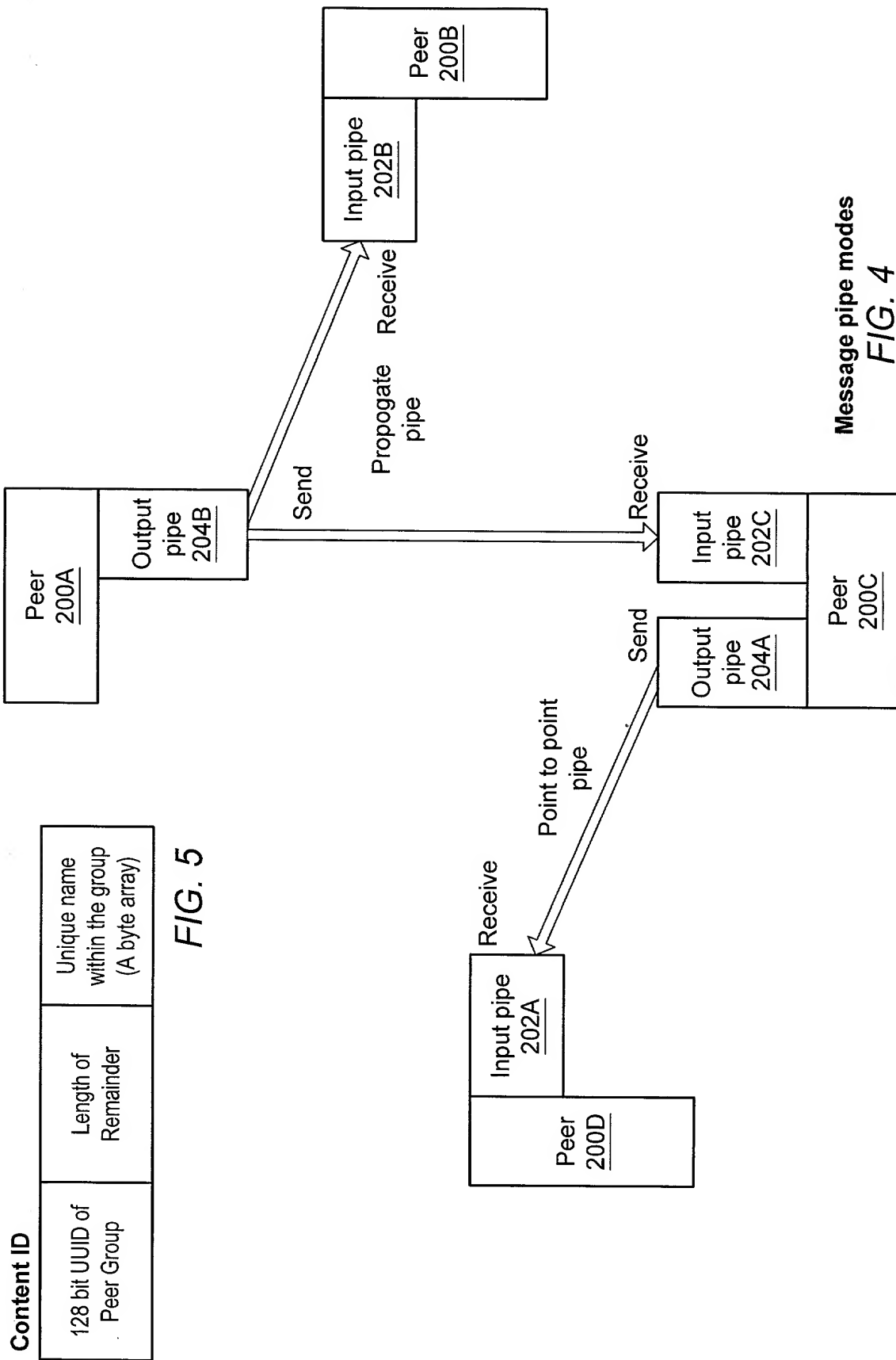


FIG. 3



Message pipe modes  
FIG. 4

Content ID		
128 bit UUID of Peer Group	Length of Remainder	Unique name within the group (A byte array)

FIG. 5

**Peer Advertisement**

Element Name (A String)	Element Value Type
Name	<String>
Keywords	<String>
Properties	<Properties>
Service	<Service Advertisement[]> (an array)
Endpoint	<Endpoint Advertisement[]> (an array)

*FIG. 6***Peer Group Advertisement**

Element Name (A String)	Element Value Type
Name	<String>
Keywords	<String>
GroupID	<ID>
PeerID	<ID>
Service	<Service Advertisement[]> (an array)

*FIG. 7*

**Pipe Advertisement**

Element Name (A String)	Element Value Type
Name	<String>
Identifier	<ID>
Type	<String>

**FIG. 8****Service Advertisement**

Element Name (A String)	Element Value Type
Name	<String>
Keywords	<String>
Identifier	<ID>
Version	<String>
Pipe	<PipeAdvertisement>
Params	<String>
URI	<String>
Provider	<String>
Access Method	<Method[]> (an array)

**FIG. 9**

**Content Advertisement**

Element Name (A String)	Element Value Type
Mime-Type (Optional)	<String>
Size	Long
Encoding	<String>
ContentID	<ID>
RefID (Optional)	<ID>
Document	<Document>

*FIG. 10***Endpoint Advertisement**

Element Name (A String)	Element Value Type
Name	<String>
Keywords	<String>
Address	<String>
Transport	<Transport Advertisement>

*FIG. 11*

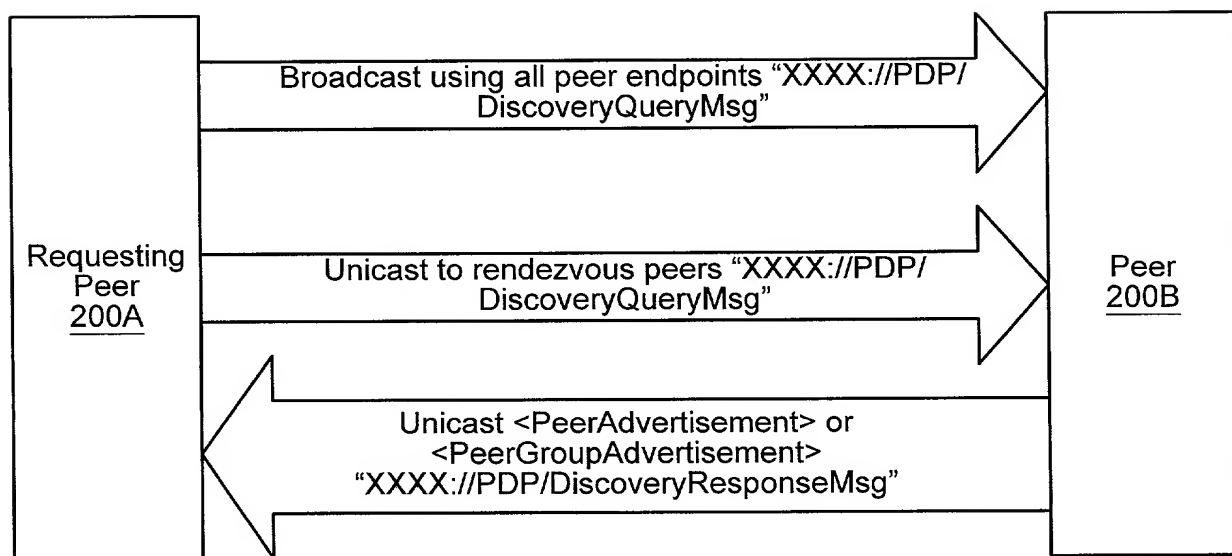


FIG. 12

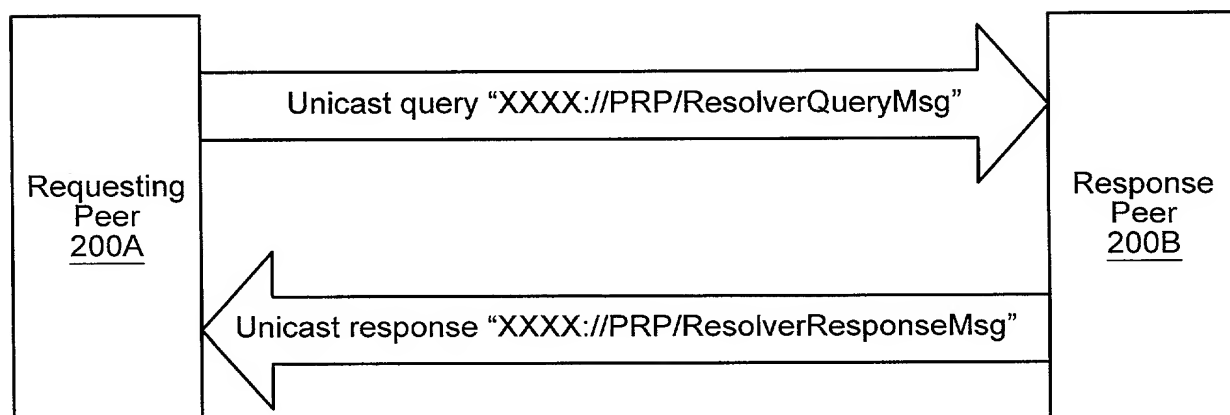


FIG. 13

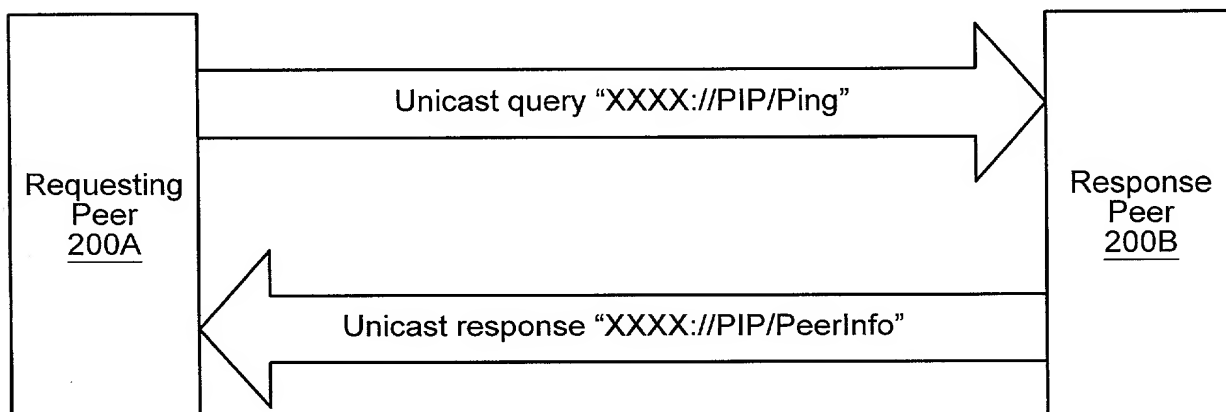


FIG. 14



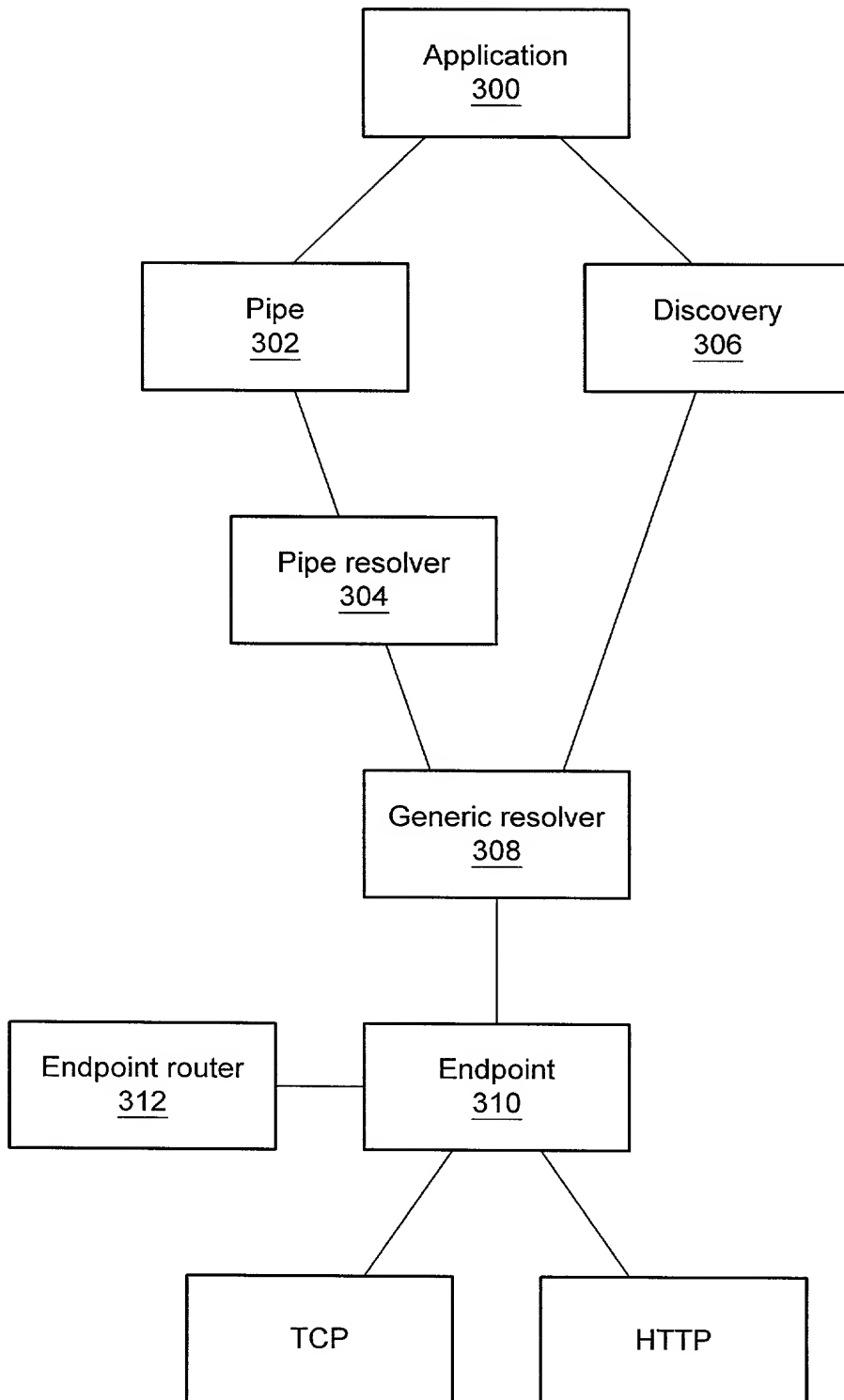


FIG. 15

10055645.012203

**The Virtual Private Network  
Access Initiated From Outside Only-Sun.Net Like**

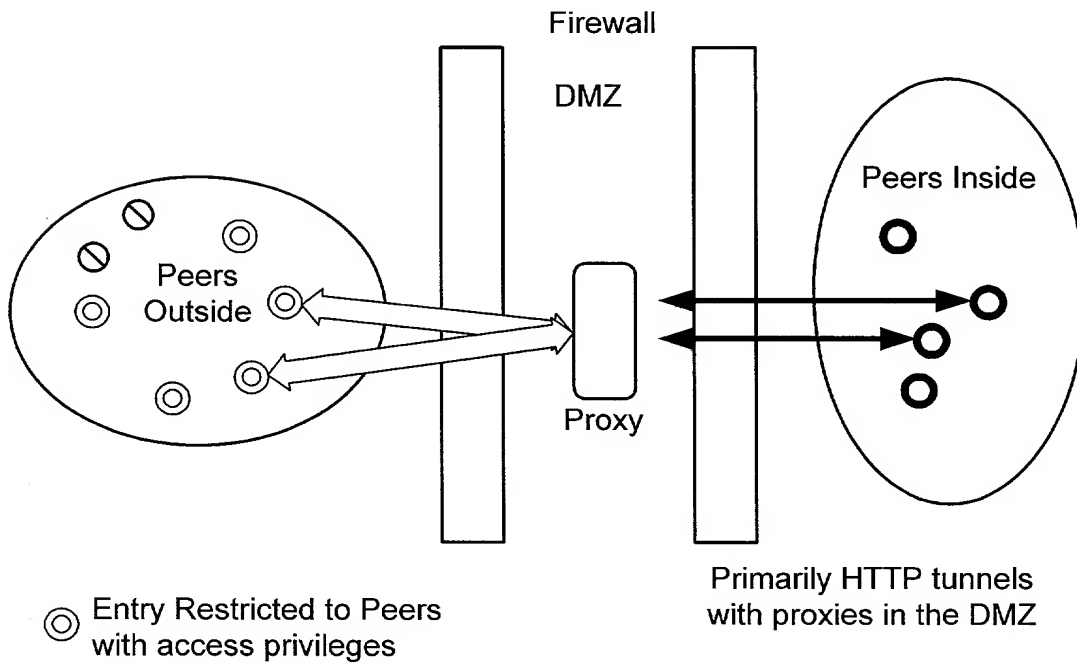
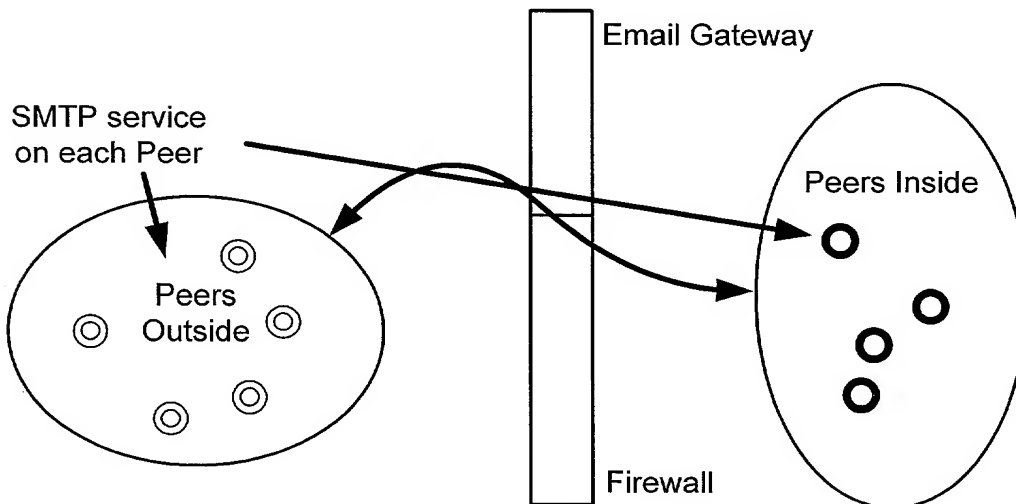


FIG. 16

**Email Exchange**



- 100% Peer-to-Peer access cannot be guaranteed
- Inside the firewall mail account administration can impose restrictions
- Cannot require email addresses for all peers outside of the firewall

FIG. 17

Access Initiated From the Inside

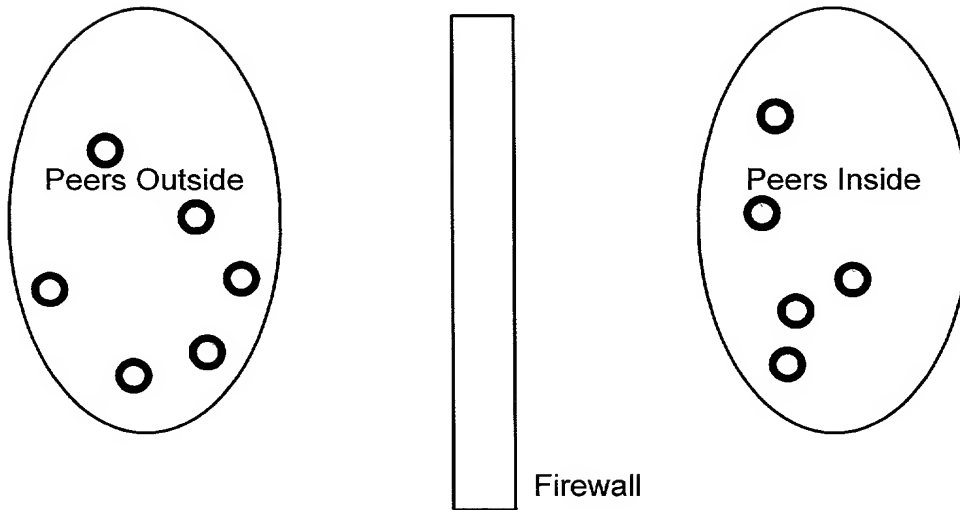
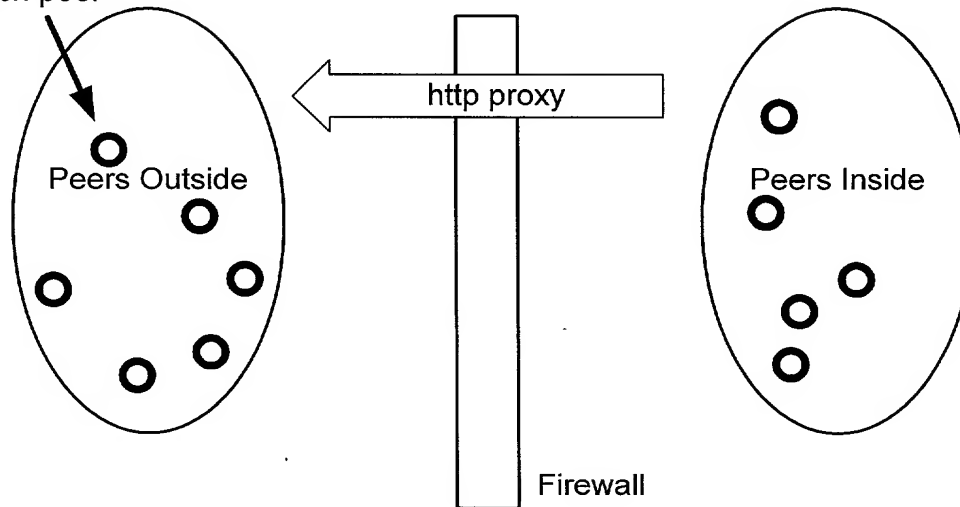


FIG. 18A

Access Initiated From the Inside

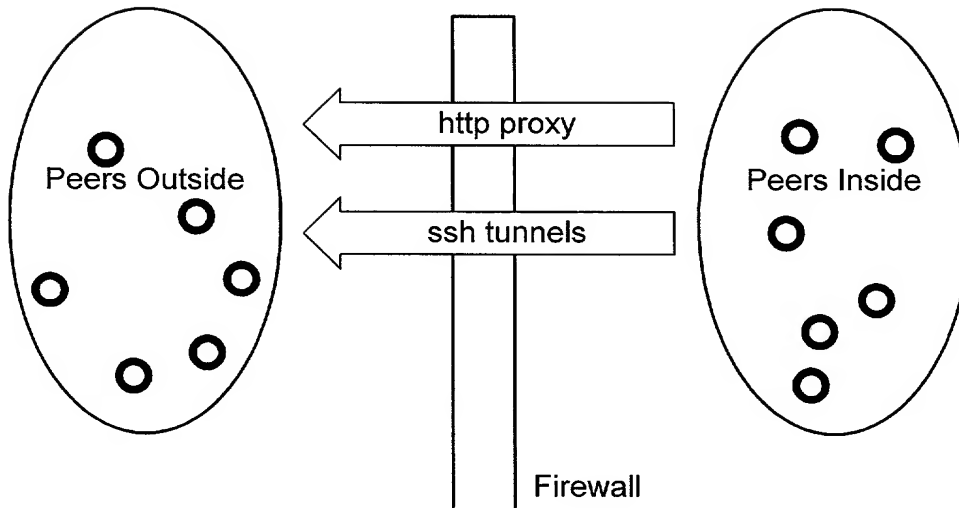
Mini http servers  
in each peer



- `http://peer:port` proxy peer-2-peer http tunnels

FIG. 18B

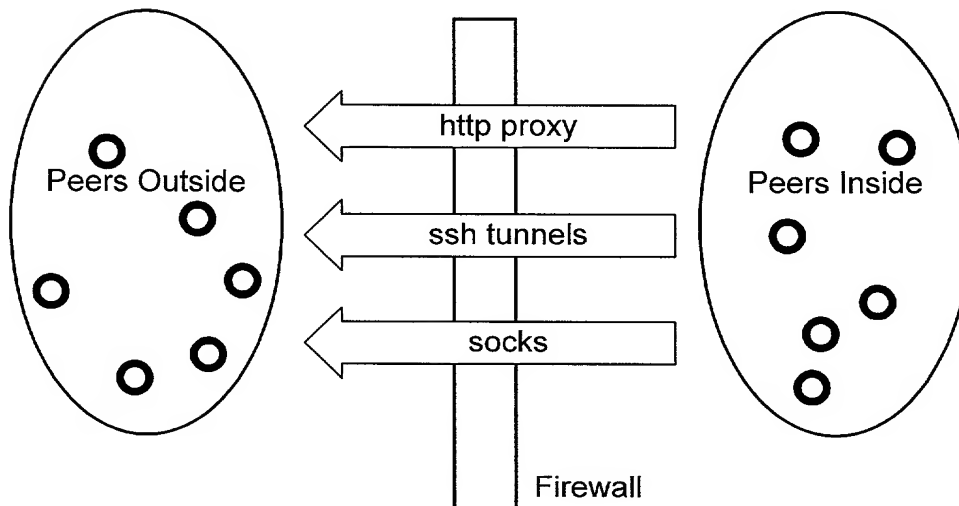
## Initiated From the Inside



- `http://peer:port` proxy peer-2-peer http tunnels
- Secure shell tunnels

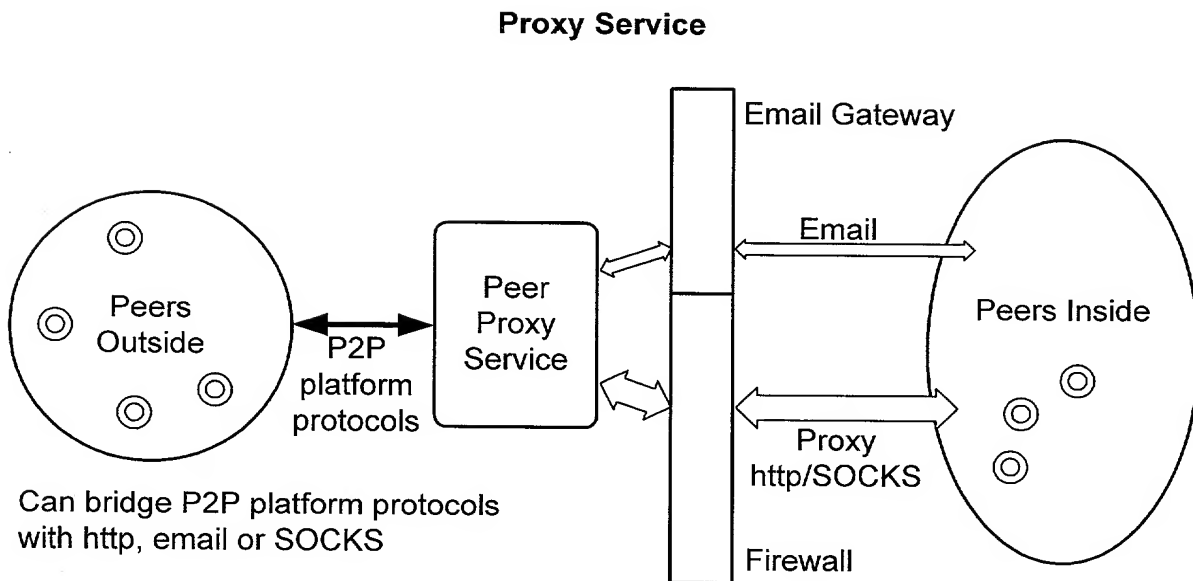
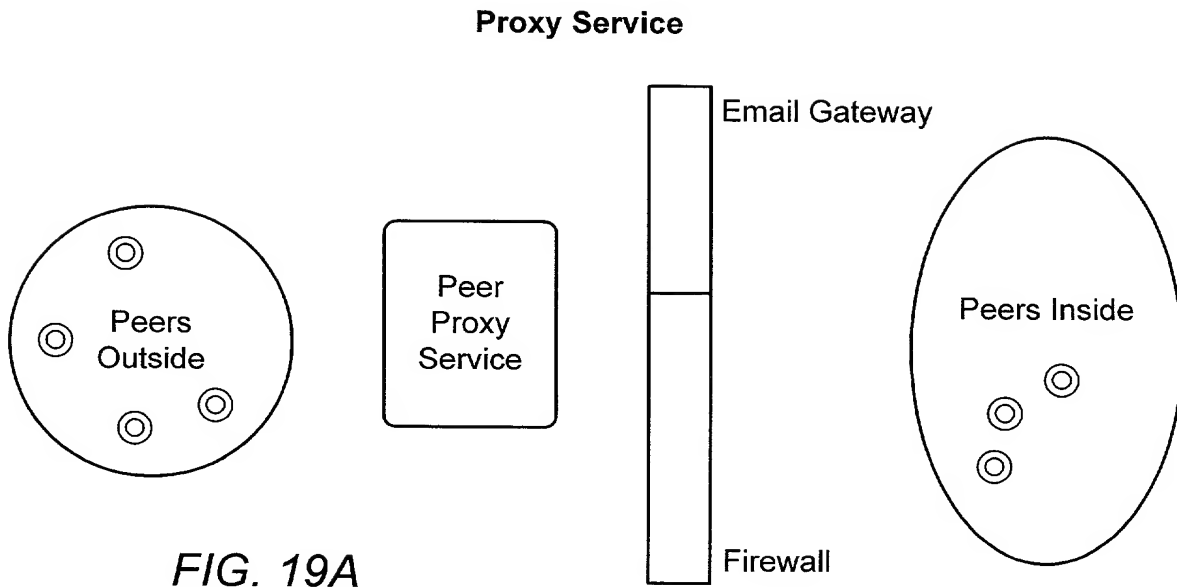
FIG. 18C

## Initiated From the Inside

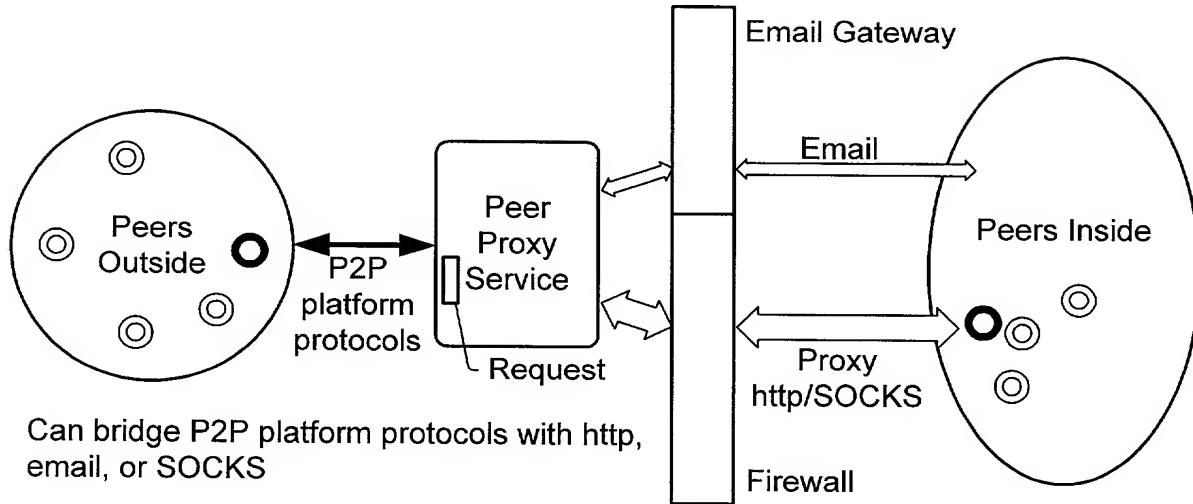


- `http://peer:port` proxy peer-2-peer http tunnels
- Secure shell tunnels
- SOCKS connections if SOCKS is supported in the firewall
- SOCKS is typically used to telnet/ftp to the exterior

FIG. 18D



## Proxy Service



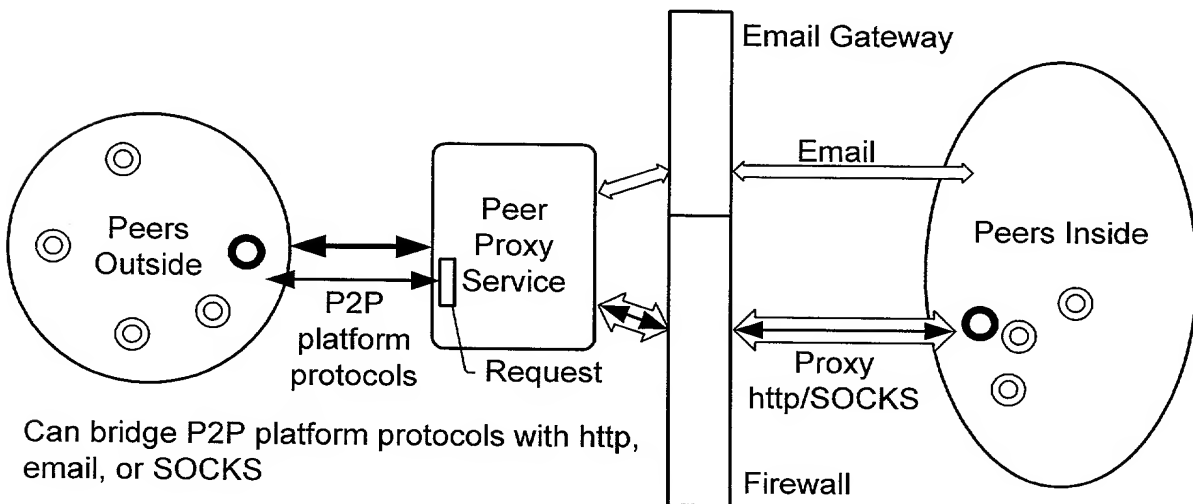
Can bridge P2P platform protocols with http, email, or SOCKS

Enable peer group contact across firewall

- Requests to communicate, and
- P2P platform messages can be posted for delivery

FIG. 19C

## Proxy Service

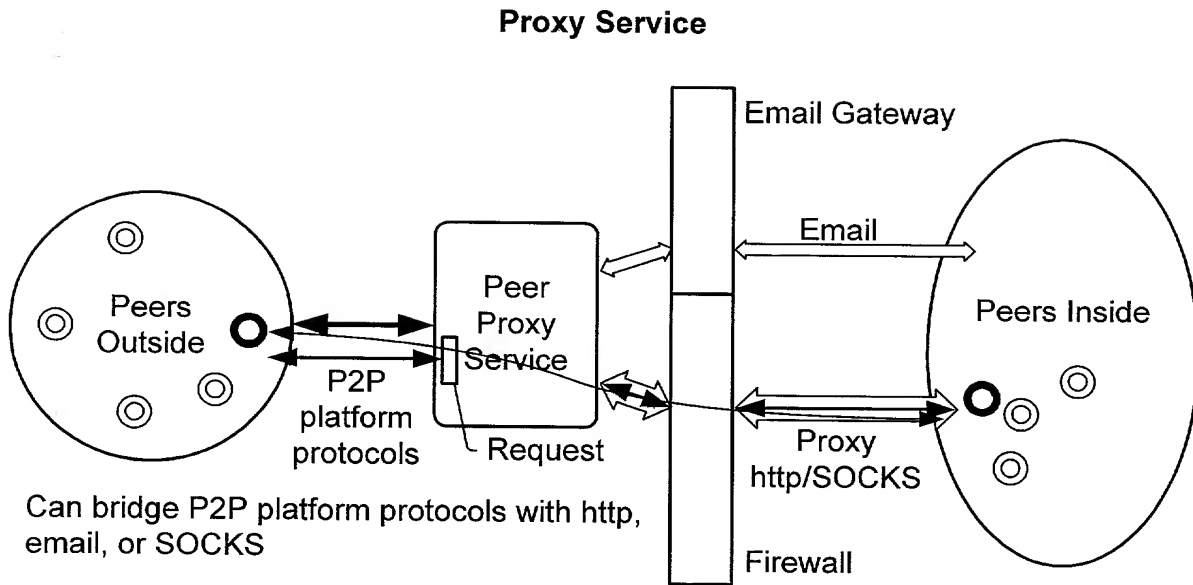


Can bridge P2P platform protocols with http, email, or SOCKS

Enable peer group contact across firewall

- Requests to communicate, and
- P2P platform messages can be posted for delivery

FIG. 19D



Can bridge P2P platform protocols with http, email, or SOCKS

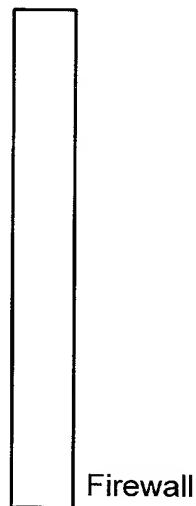
Enable peer group contact across firewall

- Requests to communicate, and
- P2P platform messages can be posted for delivery

Establish secure "pipes" as necessary

**FIG. 19E**

**Proxy Service for Peer Group Registration**



**FIG. 20A**

Proxy Service for Peer Group Registration

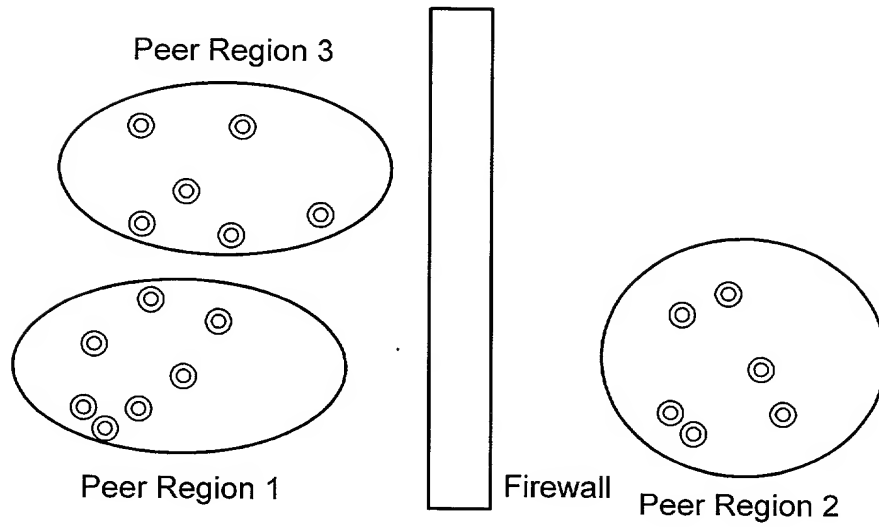


FIG. 20B

Proxy Service for Peer Group Registration

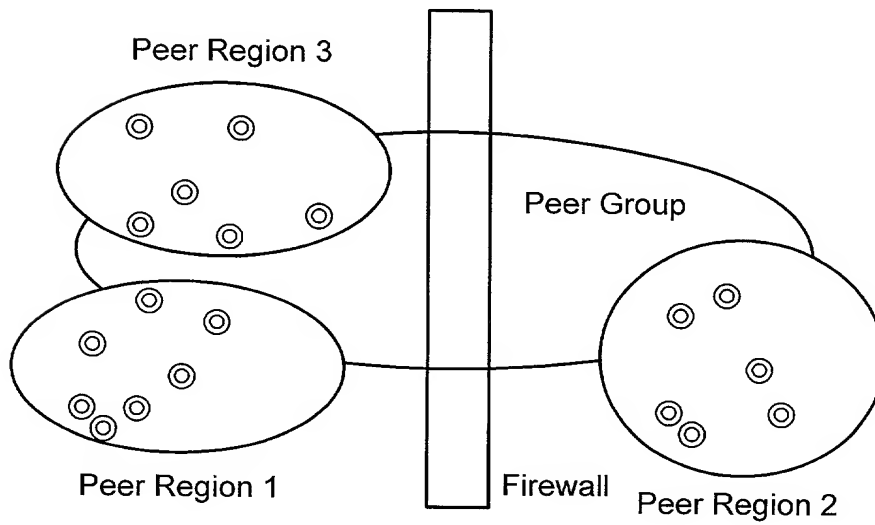


FIG. 20C

10055645.012002



### Proxy Service for Peer Group Registration

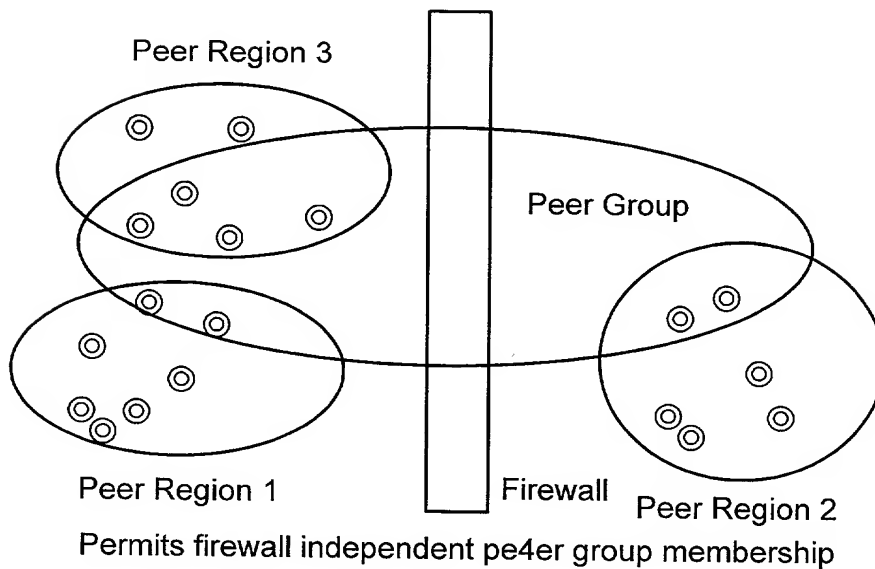


FIG. 20D

### Peer Group Registration

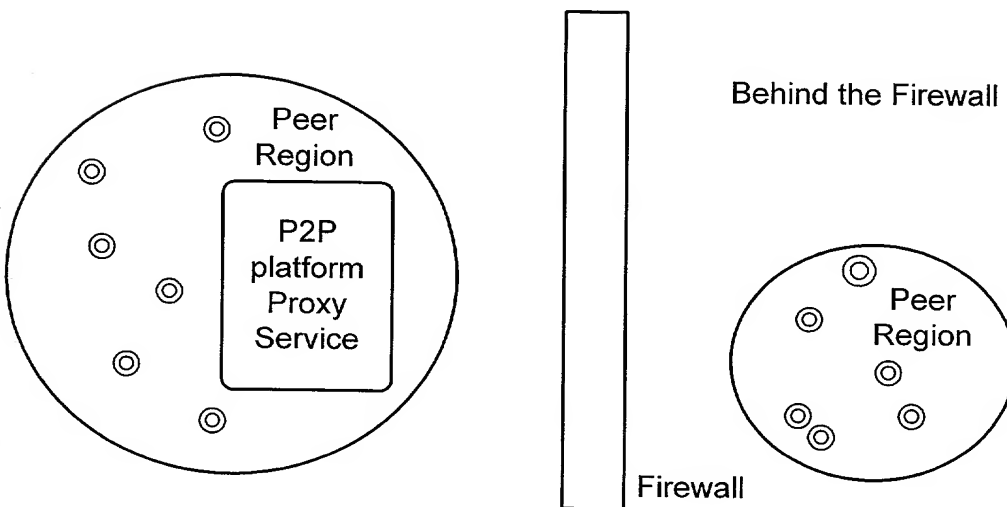


FIG. 21A

### Peer Group Registration

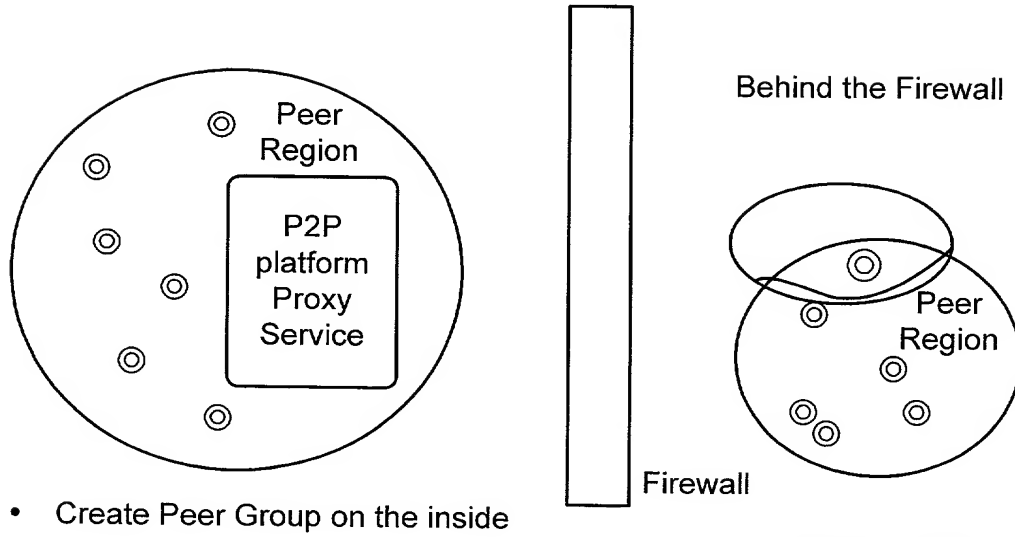


FIG. 21B

### Peer Group Registration

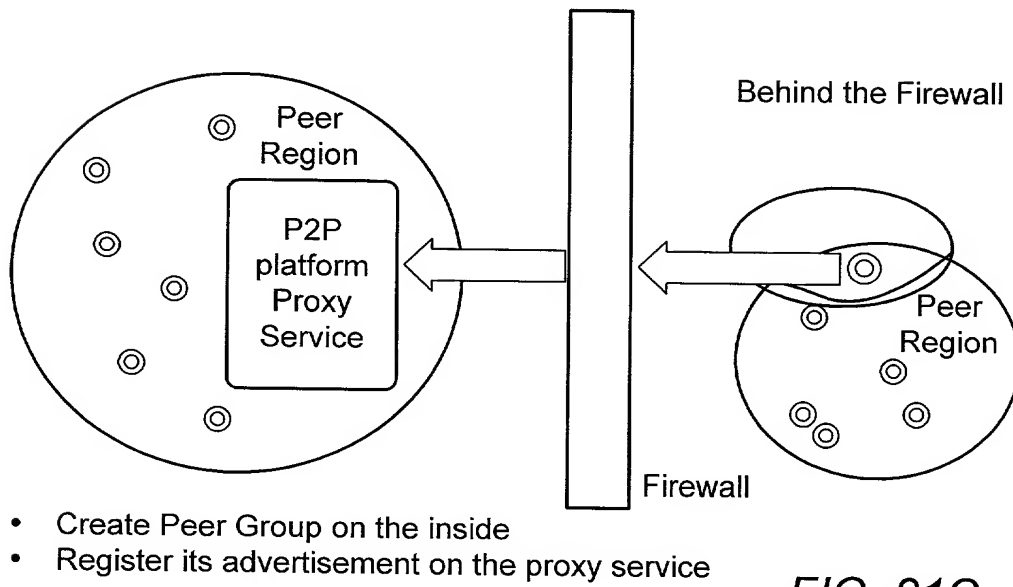
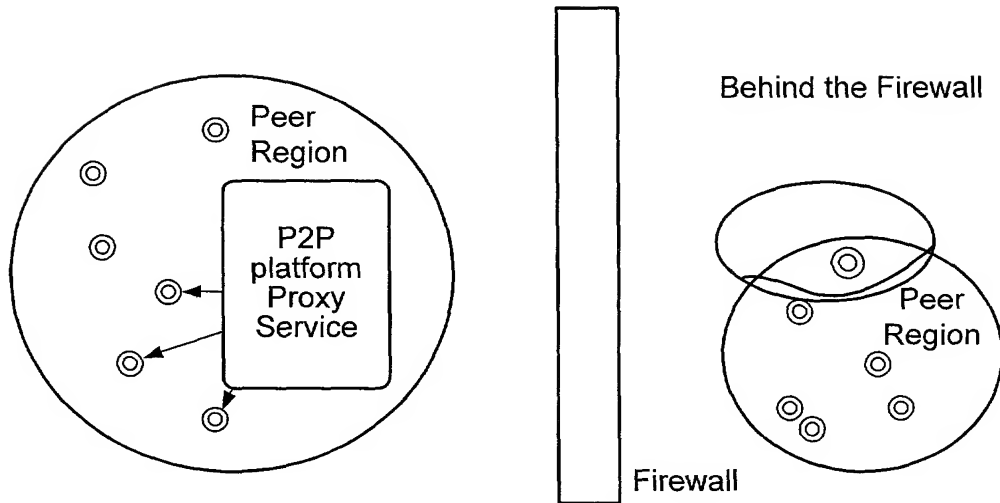


FIG. 21C

## Proxies Peer Group Registration



- Create Peer Group on the inside
- Register its advertisement on the proxy service
- Notify peers in proxy service's region only
- Notify other known P2P platform proxy services

FIG. 21D

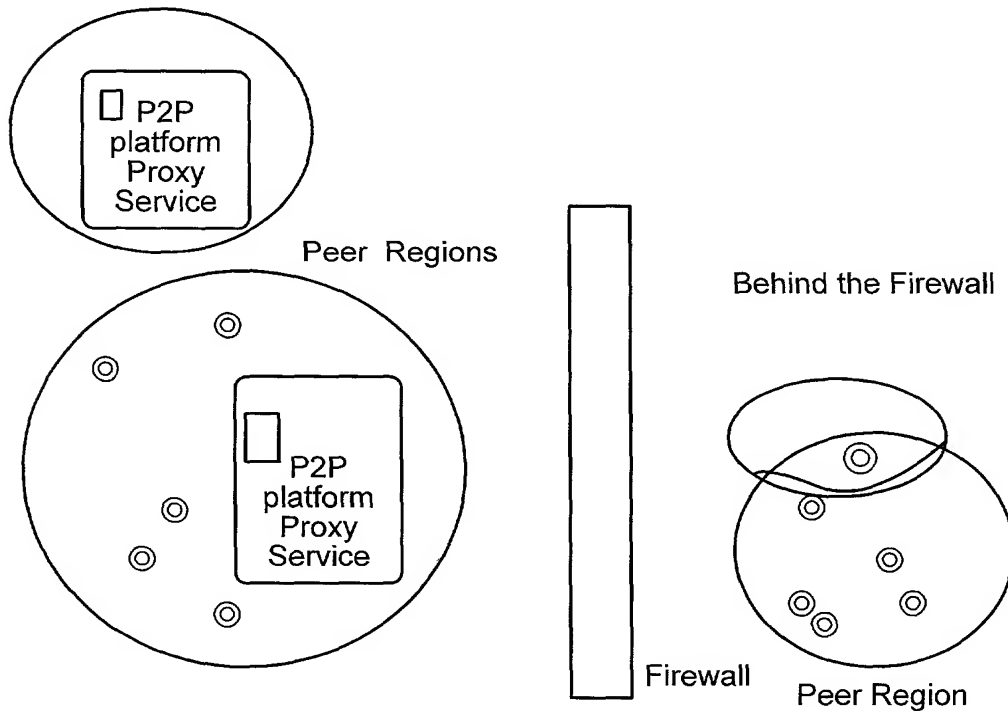


FIG. 22A

## Proxies Peer Group Membership

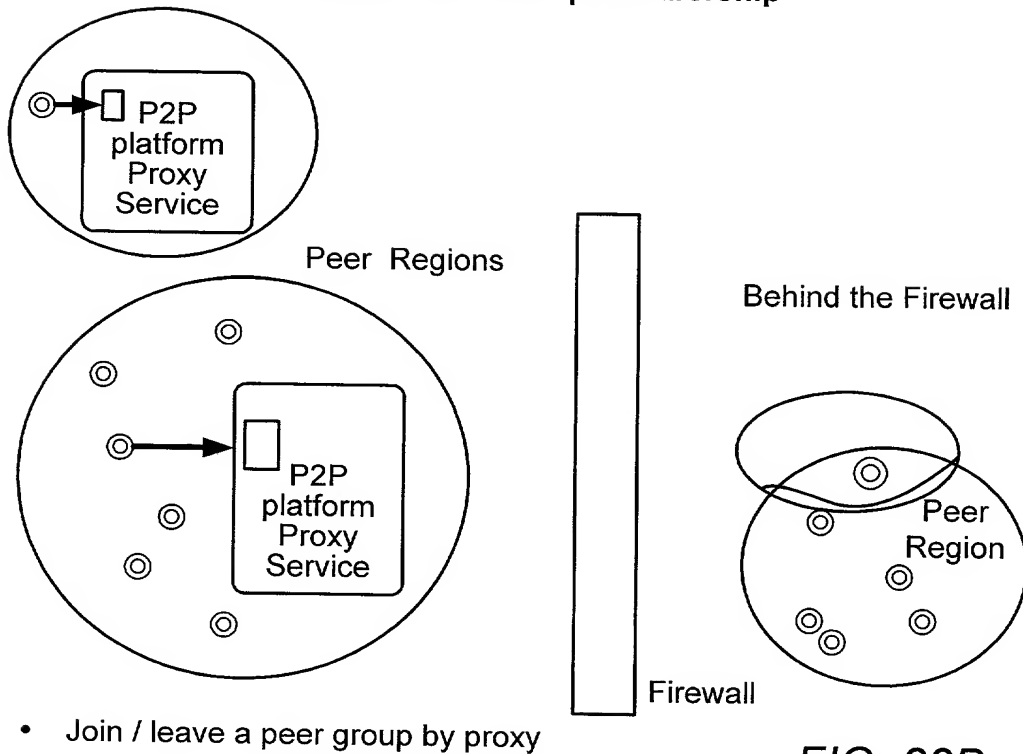


FIG. 22B

## Proxies Peer Group Membership

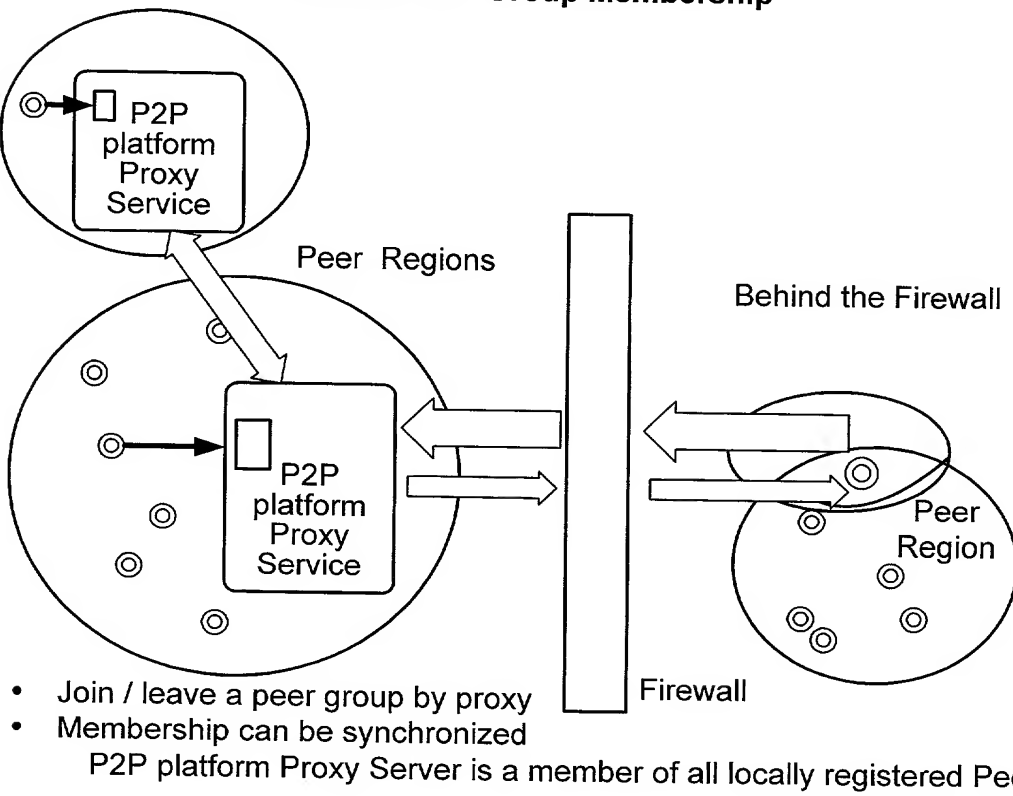


FIG. 22C

### Levels of Authentication

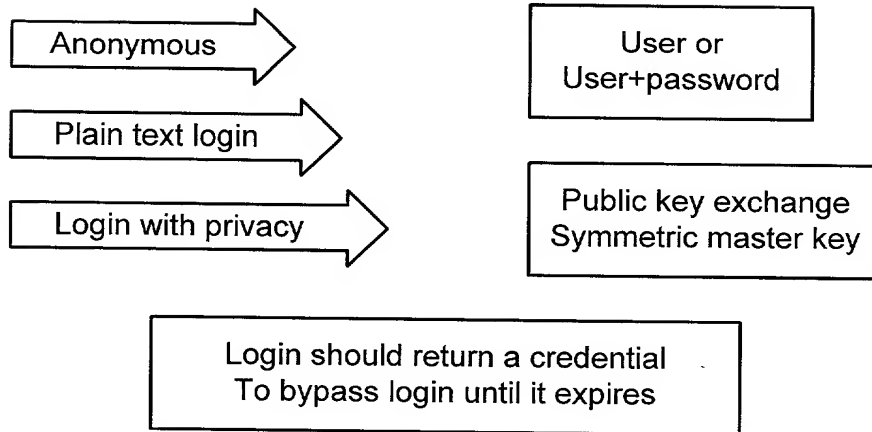


FIG. 23

### P2P platform proxy service Public Key Chain

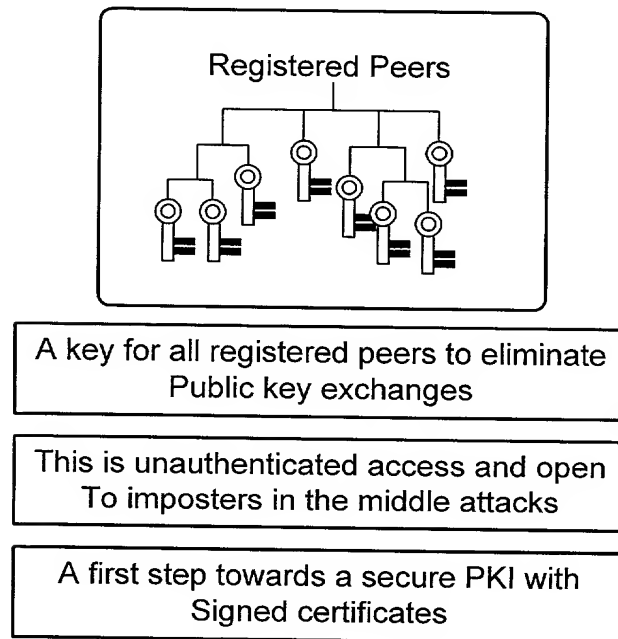


FIG. 24

Privacy

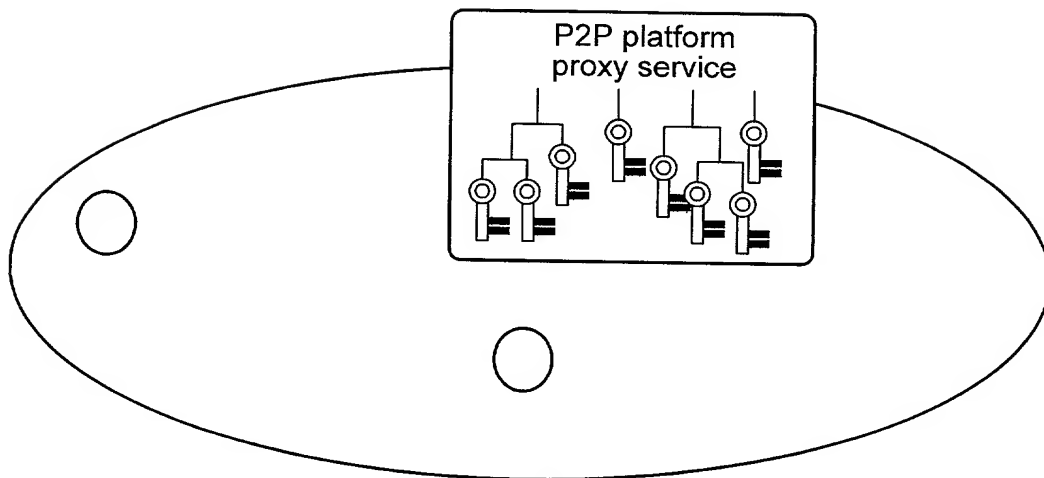
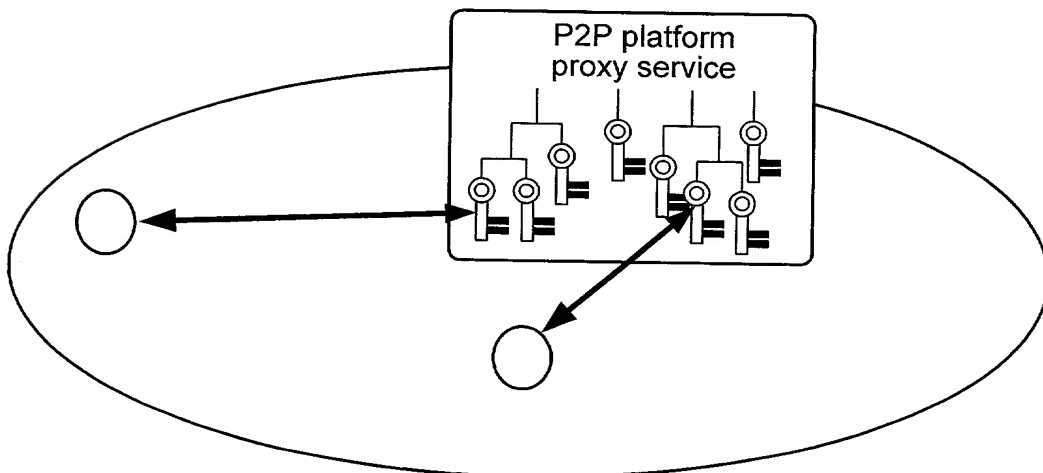


FIG. 25A

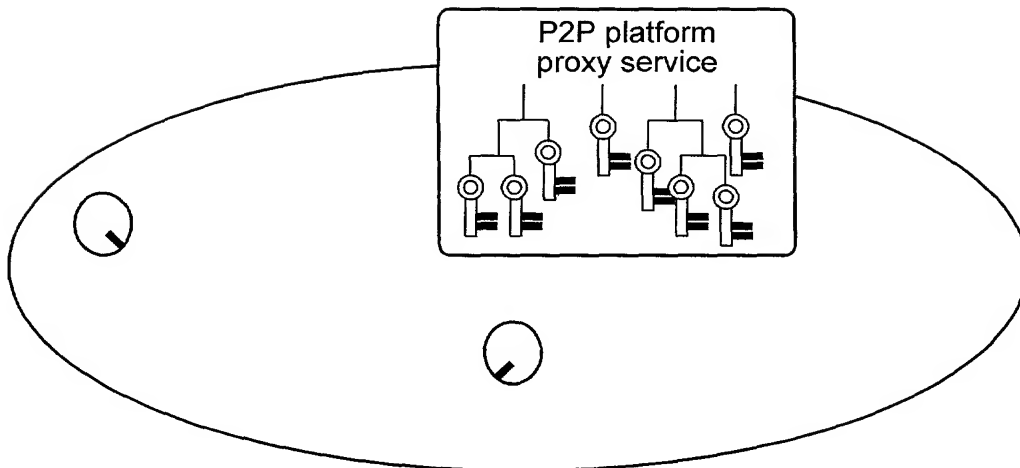
Privacy



- Fetch and cache public key (Should have expiration date)

FIG. 25B

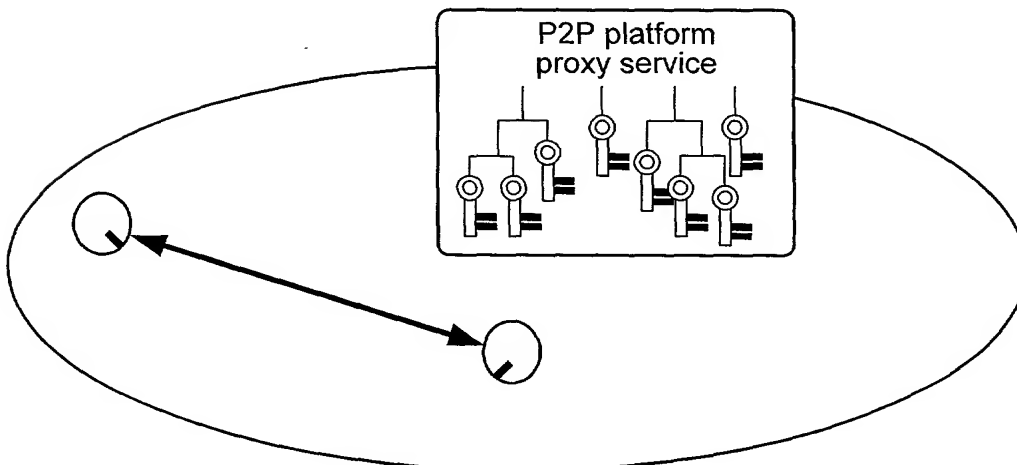
Privacy



- Fetch and cache public key (Should have expiration date)
- Compute master secret

FIG. 25C

Privacy



- Fetch and cache public key (Should have expiration date)
- Compute master secret
- Send cipher text

FIG. 25D

# **Integrity** **What You Sent Is What I Received**

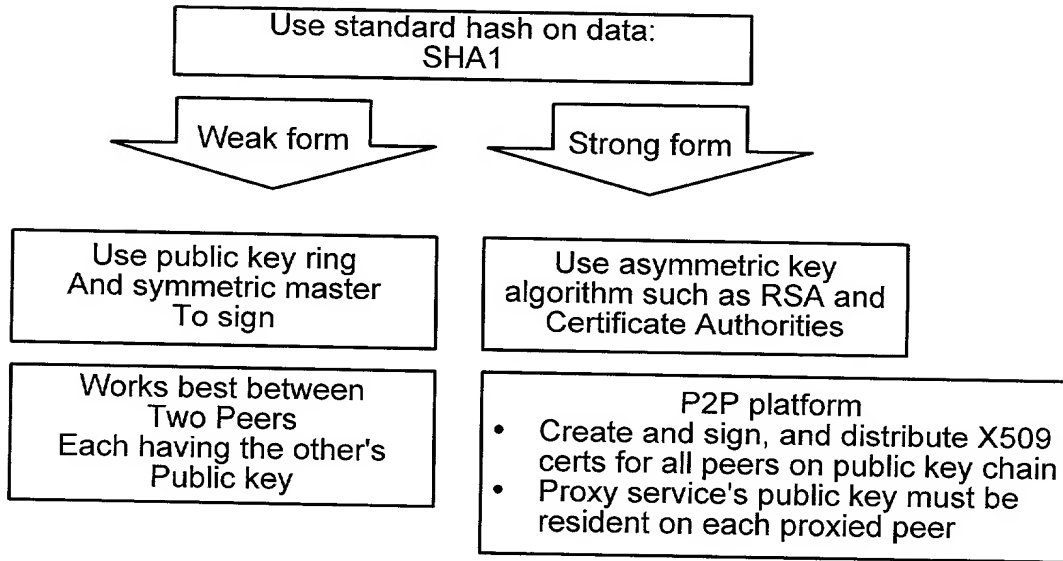


FIG. 26

## **Peer-to-peer platform proxy service as a Certificate Authority**

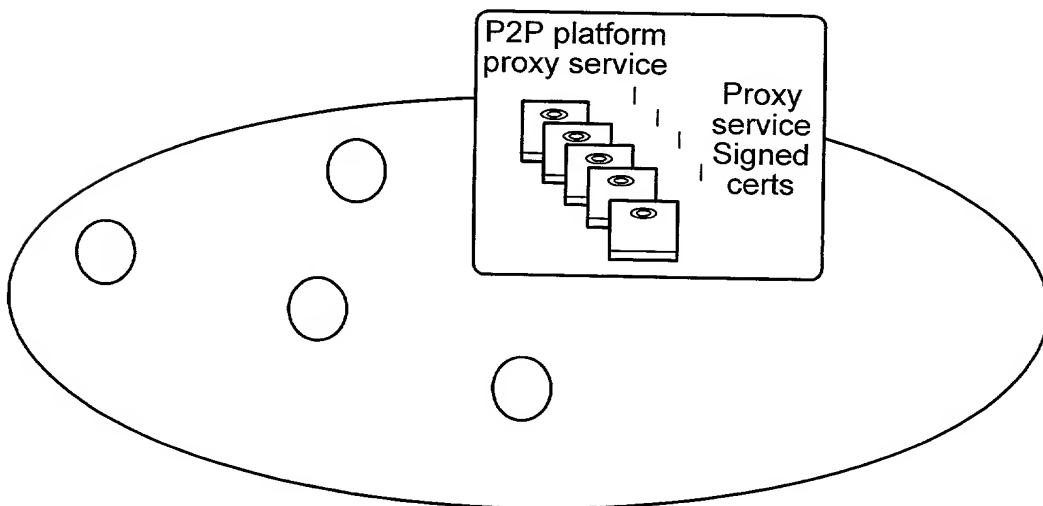
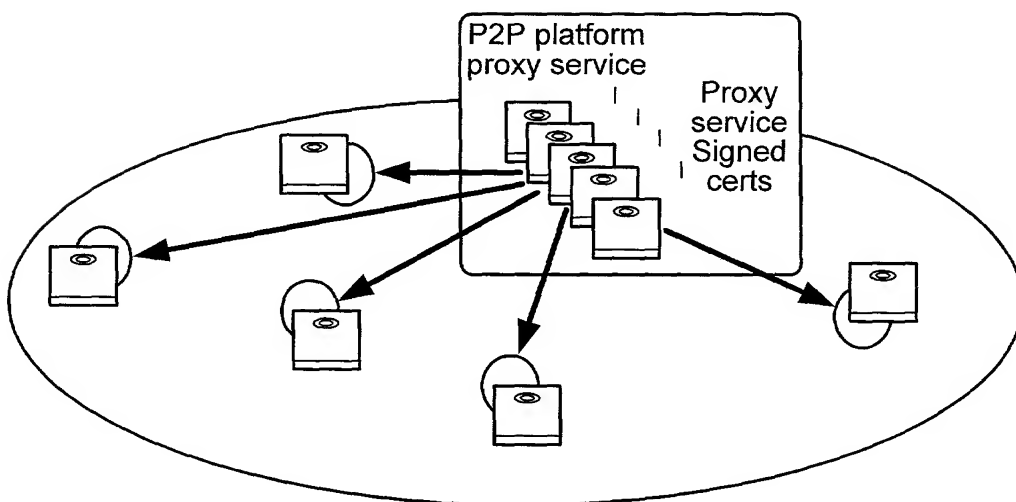


FIG. 27A

10055645.012202



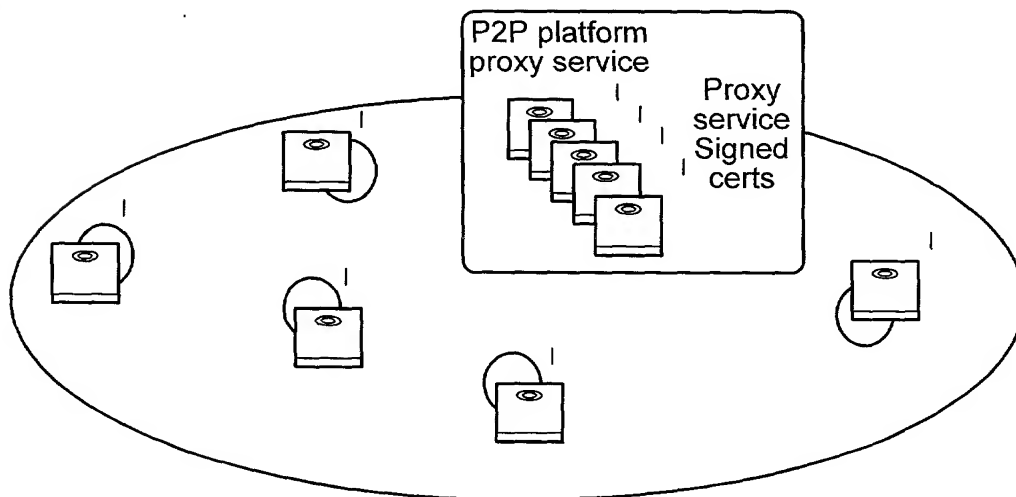
# Peer-to-peer platform proxy service as a Certificate Authority



- Distribute signed certs as required on peer requests

FIG. 27B

# Peer-to-peer platform proxy service as a Certificate Authority

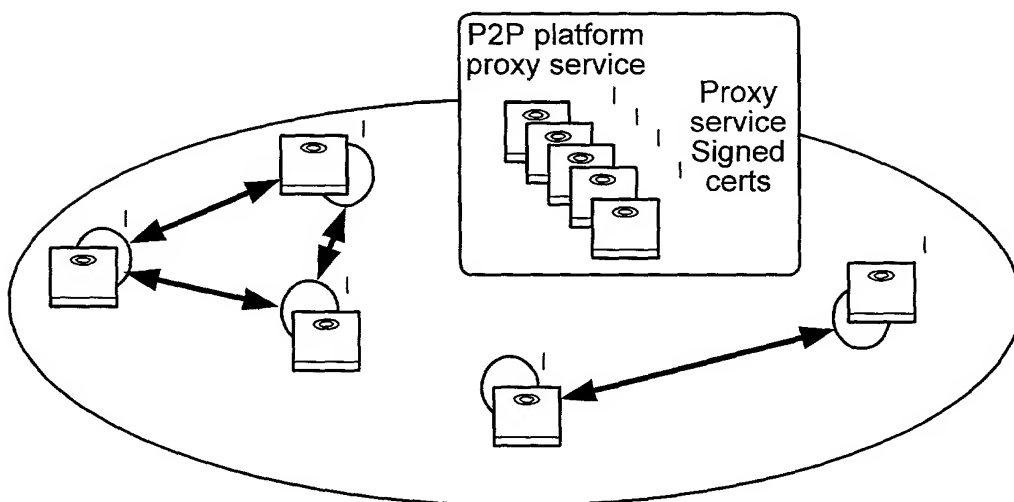


- Distribute signed certs as required on peer requests
- Peers Validate peer-to-peer platform proxy service Signature with resident proxy service public key

FIG. 27C

202205495500T 10055645 012203

### Peer-to-peer platform proxy service as a Certificate Authority



- Distribute signed certs as required on peer requests
- Peers Validate peer-to-per platform proxy service Signature with resident proxy service public key
- Sign content with destination peer's public key and distribute cipher text

**FIG. 27D**

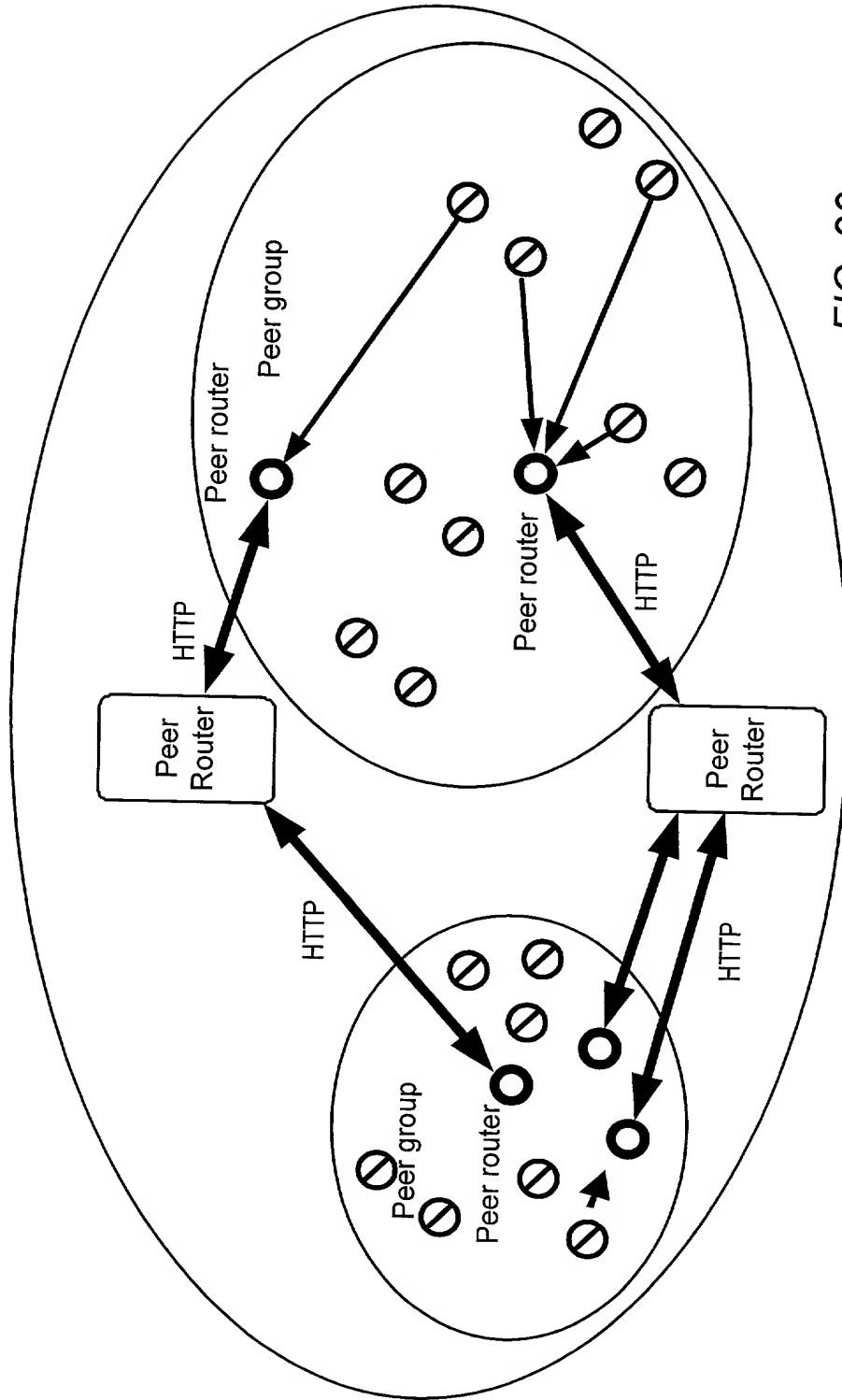


FIG. 28

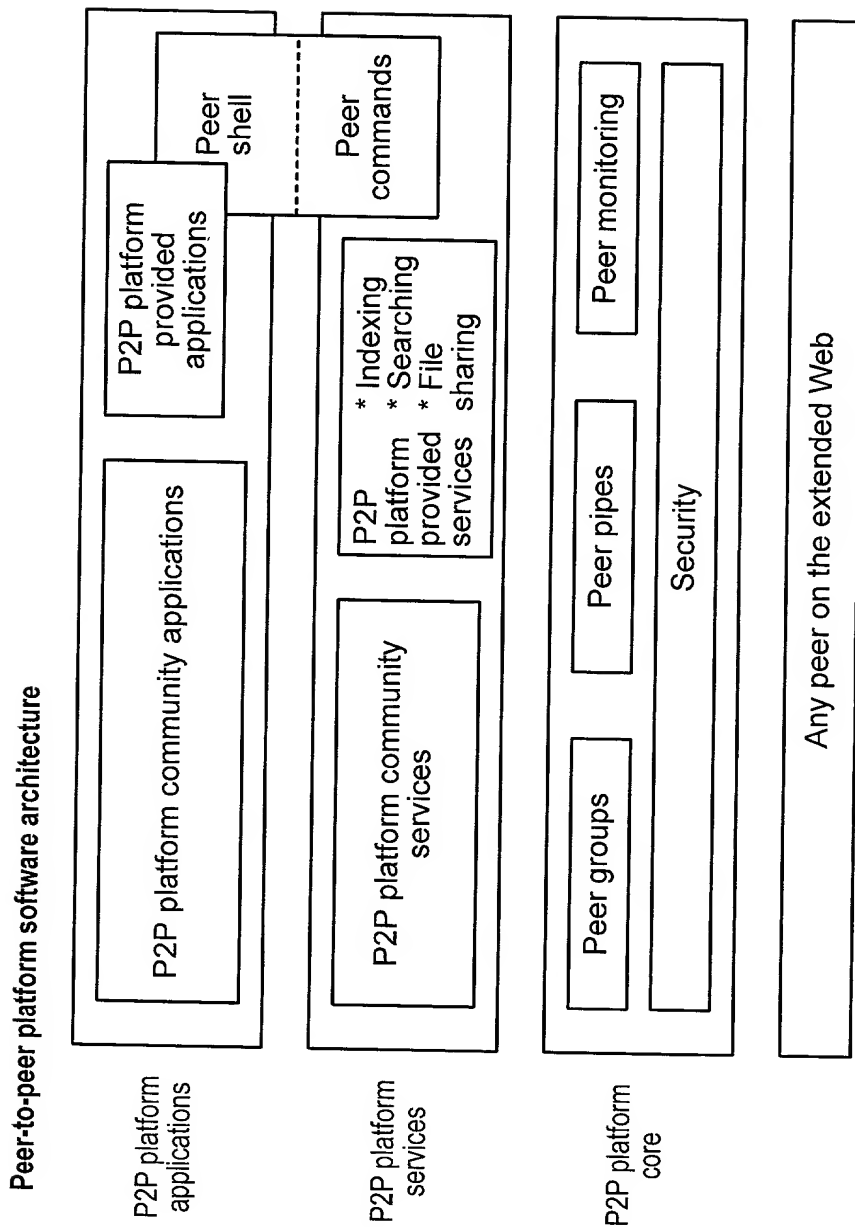


FIG. 29

**Discovery Issues**

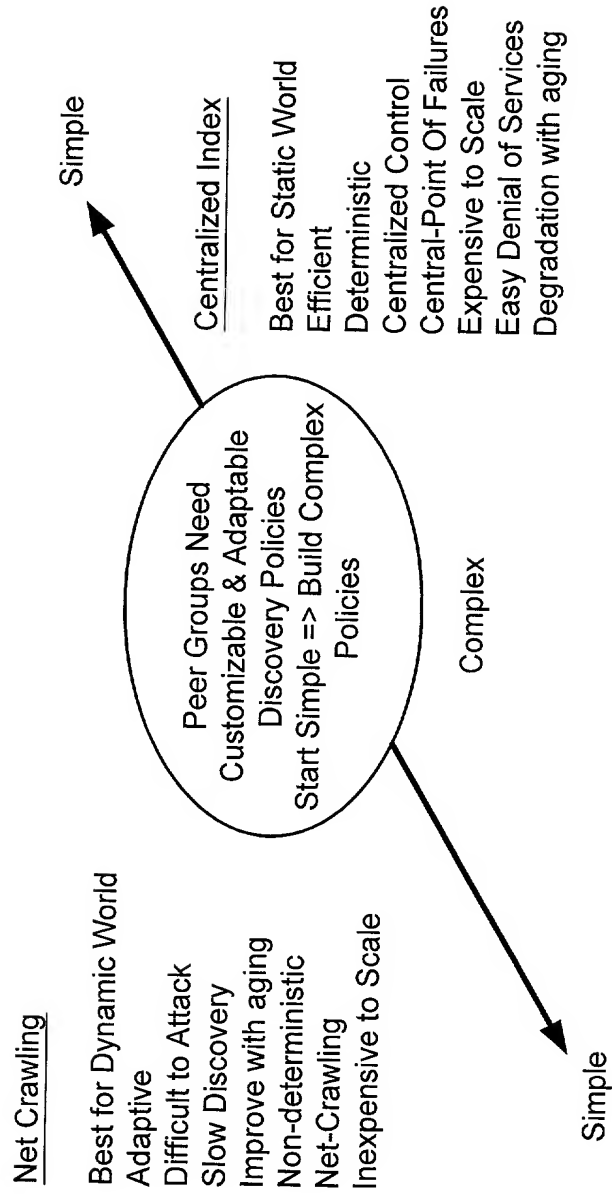
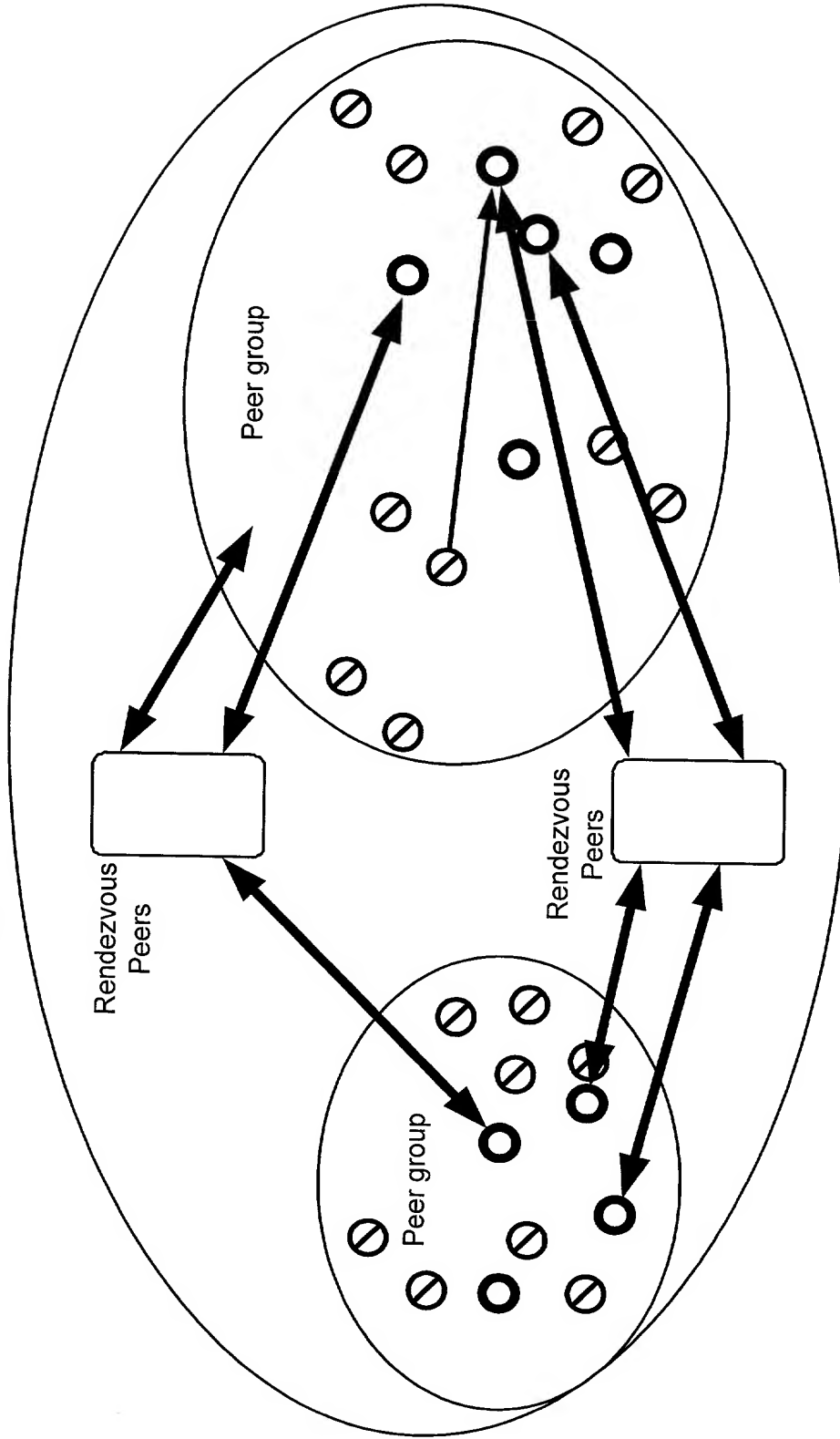


FIG. 30

# Discovery Through Rendezvous Proxy



Rendezvous Access Restricted to Peers with access privileges  
Non trusted peers contact local trusted peers

Rendezvous Peers  
Cache Peer & Peer Group Info

FIG. 31

Discovery Through Propagate Proxies

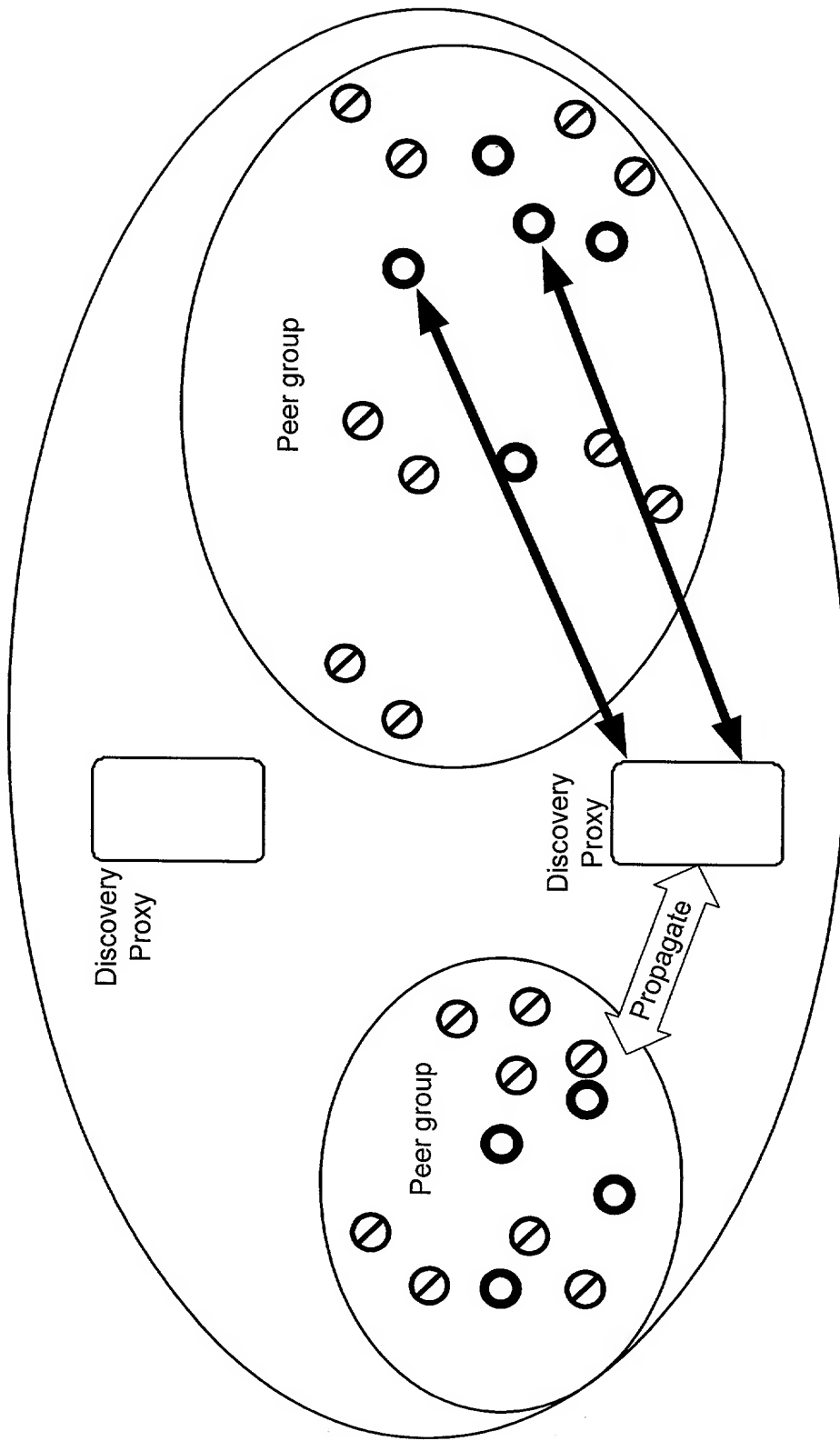


FIG. 32